PULSE High-frequency Sound Power Type 7888

Type 7888 is a dedicated software package that supports the sound power determination of high-frequency noise emitted by certain machinery and equipment in the frequency range 11.2 to 22.4 kHz. High-frequency noise can be broad- or narrow-band and discrete tones (such as power supplies, video displays and medical devices).

This type of noise emission can be particularly annoying and is becoming the subject of national and international regulations for the protection of the environment, including safer and healthier places of work and accommodation.

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Uses, Benefits and Features

Uses
- Determination of sound power levels according to ISO 9295
- Complementing methods of ISO 3741 and 3744

Benefits
- Adhere to the procedures of the standards
- Efficient, time saving measurement procedures
- Minimal training required

Features
- Response equalization for a flat response up to 22.4 kHz
- Support of the four measurement methods of ISO 9295
- Automatic test report
- Guaranteed sound power level noted in test report
- Easy-to-use interface
- Dedicated workflow

Brüel & Kjær

PULSE™ High-frequency Sound Power Type 7888 is a PULSE template that manages the measurement of high-frequency noise using measurement methods described in ISO 9295 and calculates the guaranteed sound power level for each item tested.

As it is part of the PULSE platform, you can combine Type 7888 with other PULSE sound and vibration measurement applications for a complete and flexible product testing program aimed at standards compliance and non-conformance problem resolution.

User Interface

The software has a logical, task-based workflow that allows you to skip repetitive tasks. Graphical features, such as pop-up text, colour coding and warnings, allow quick updates on measurement status, determination of pending actions, and validation of specific parameters within the standard.

Fig. 1
Workflow is divided into tasks (far left) such as the Setup task, in which you select the measurement method
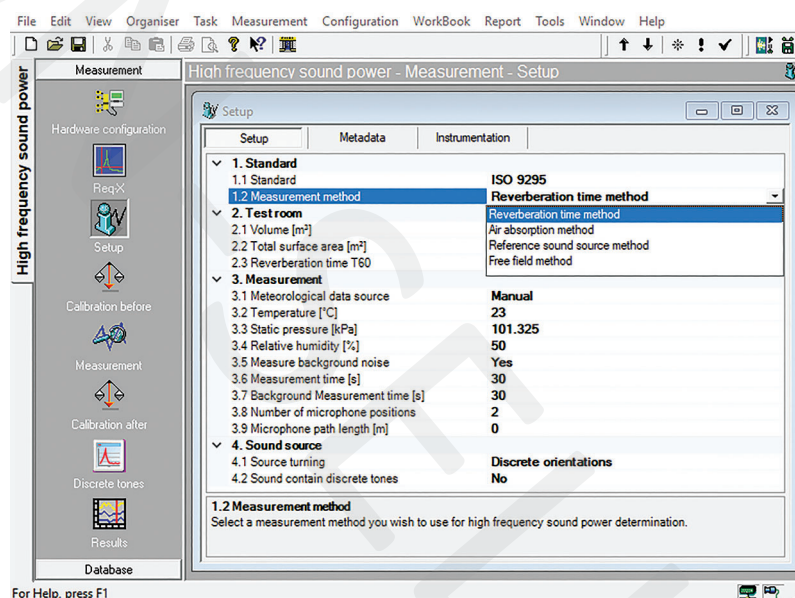
Measurement Methods

Type 7888 supports the four measurement methods used to measure sound power at high frequencies that are described in ISO 9295: reverberation time method, air absorption method, reference sound source method and free-field method. These methods complement the methods described in ISO 3741 and 3744.

When you select the desired measurement method in the Setup task, the template automatically adjusts to show only the applicable set-up parameters.

Results

Export results to Microsoft® Excel® for report generation. Combine the results from Type 7888 with results from PULSE Sound Power Type 7799 (for essentially free-field environments) and from PULSE Sound Power in Reverberation Rooms Type 7884 to create a report that covers high- and low-frequency ranges.

Fig. 2
Response Equalization: achieve a flat frequency response in the range 11.2 to 22.4 kHz using the Req-X task

The minimum hardware requirement for using Type 7888 is a microphone and a LAN-XI Data Acquisition Front End designed for use in the frequency range of interest.

½″ Diffuse-field TEDS Microphone Type 4942-A-021 is recommended for making measurements using Type 7888 because of its flat frequency response over the desired frequency range. The microphone can be used with Input Module LAN-XI 51.2 kHz Type 3050 which includes Front Panel UA-2100.

Req-X

It is recommended that the microphone you use for measurements has a flat frequency response over the range in which you are measuring. To ensure this, use the Req-X task of Type 7888 to apply a correction to your microphone's frequency response.
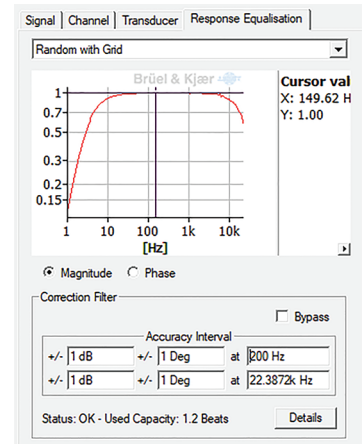
Other Configurations

Type 7888 supports configurations that use, for example, more microphones, other measurement surfaces, booms, or a reference sound source.

Equipment Emitting Discrete Tones

Measurements of discrete tones are performed in the 1/12-octave. If a reference sound source is used, it requires calibration in the 1/12-octave.

Fig. 3
*Calibration data (**left**) for Reference Sound Source Type 4204 (**right**) used to measure environmental corrections are imported into Type 7888*
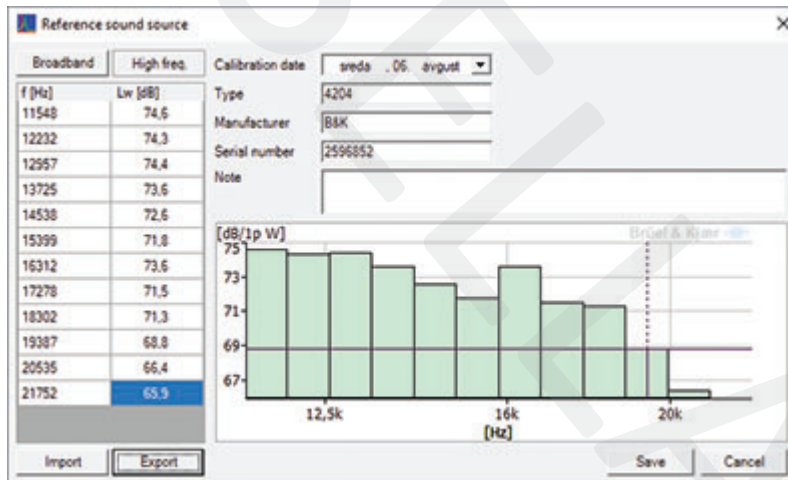
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Type 7888 is a is a Windows®-based application for use with PULSE. It provides measurement and calculation procedures as described in international standard ISO 9295:2015, Acoustics: determination of high-frequency sound power levels emitted by machinery and equipment

Software is delivered via installation media (DVD or USB). The licence is either: node-locked to a PC host ID or dongle; or floating, locked to a network server

System

SYSTEM REQUIREMENTS

- The following BK Connect™ applications:
  – Data Viewer Type 8400
  – Hardware Setup Type 8401
  – Data Processing Type 8403
  – CPB Option Type 8405-C
- Microsoft® Windows® 10 Pro or Enterprise (x64) with either Current Branch (CB) or Current Branch for Business (CBB) servicing model; or Windows® 7 Pro, Enterprise or Ultimate (SP1) (x64) operating systems
- Microsoft® Office 2016 (x32 or x64) or Office 2013 (x32 or x64)
- Microsoft® SQL Server® 2014 Express (SP2) (included in installation), Microsoft® SQL Server® 2014 (SP2), SQL Server 2012 R2, SQL Server 2008 or 2008 R2 Express Edition SP1

RECOMMENDED SYSTEM CONFIGURATION

- Intel® Core™ i7, 3 GHz processor or better
- 32 GB RAM
- 480 GB Solid State Drive (SSD) with 20 GB free space, or better
- 1 Gbit Ethernet network[*]
- Microsoft® Windows® 10 Pro or Enterprise (x64), CB
- Microsoft® Office 2016 (x32)
- Microsoft® SQL Server® 2014 (SP2)
- Screen resolution of 1920 × 1080 pixels (full HD)

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[*] A dedicated data acquisition network (LAN or WAN) is recommended; a network that only handles data from the front end improves the stability of the data

HARDWARE REQUIREMENTS

Minimum requirement:
- One microphone
- One LAN-XI Data Acquisition Front End for PULSE

Calibration

Calibration is performed using Calibration Master, an integrated PULSE LabShop component, that can be set up to initiate calibration. The full calibration history for a transducer can be retained in the Transducer Database, which allows monitoring of calibration data variations over a period of time. Global calibration allows you to build up a calibration database that is shared across all PULSE projects.

High-frequency Sound Power (PULSE Template)

SUITABLE TEST ENVIRONMENTS

- Reverberation rooms as specified in ISO 3741
- Free-field over a reflecting plane as specified in ISO 3744

MEASUREMENTS

Time-averaged sound pressure levels:
- Produced by the background noise
- From the reference sound source
- From the noise source under test

All quantities are measured in one of the following:
- 1/3-octave band for any range with nominal mid-band frequencies from 50 Hz to 20 kHz
- 1/1-octave band for any range with nominal mid-band frequencies from 63 Hz to 16 kHz
- 1/12-octave band for any range with nominal mid-band frequencies from 50 Hz to 22.4 kHz

A-weighted values calculated from 1/1-octave or 1/3-octave values as specified in Annex C of ISO 3745: 2012

CALCULATIONS

- Background noise corrections
- Mean corrected time-averaged sound pressure level from the reference sound source over all source positions
- Mean corrected time-averaged sound pressure level from the noise source under test over all source positions
- Sound power level

Ordering Information

Type 7888-X[†] PULSE High-frequency Sound Power

Requires the following software:
- Type 8400: BK Connect Data Viewer
- Type 8401: BK Connect Hardware Setup
- Type 8403: BK Connect Data Processing
- Type 8405-C: BK Connect CPB Option

SOFTWARE MAINTENANCE AND SUPPORT AGREEMENTS

M1-7888-X[†] Agreement for Type 7888, one year

RECOMMENDED HARDWARE

Type 4942-A-021	½″ Diffuse-field TEDS Microphone, includes Preamplifier Type 2671
Type 3050-A-060	6-ch. Input Module LAN-XI 51.2 kHz (Mic, CCLD, V)
Type 4231	Sound Calibrator

[†] X = N (for node-locked license) or F (for floating license)

Supported Brüel & Kjær Products (Optional)

SOFTWARE

Type 7799-X[†]	PULSE Sound Power
Type 7884-X[†]	PULSE Sound Power in Reverberation Rooms

Annual Software Maintenance and Support Agreements are available for all software products

HARDWARE

Type 4204	Reference Sound Source
Type 3923	Rotating Boom
UA-0801	Lightweight Tripod

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